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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,208	06/23/2003	Amar N. Neogi	25194	2234

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EXAMINER
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KILIMAN, LESZEK B

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/602,208

Applicant(s)

NEOGI ET AL.

Examiner

leszek b kiliman

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1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 20 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over “Acetylation of Solid Wood Using Microwave Heating, Part 2. experiments in Laboratory Scale” by Breid et al.

Breid discloses an esterified pine wood made by a process comprising using an untreated pine wood having a moisture content of less than 8% ( see Table 4), impregnating the wood with acetic anhydride, microwave heating the impregnated wood at a temperature between 120-130 degree C in a time between 30 to 240 minutes (see Figure 3) to cause esterification reaction between acetic anhydride and hydroxyl groups in the lignocellulosic material of the wood to yield an esterified wood having a degree of esterification or weight gain of about 20 % (see Introduction and Table 2),, removing of excess acetic anhydride and by-product acetic acid by evaporation under vacuum for two hours at 120 degree C to produce a final wood product

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having a total residue chemicals of about 1.6 % ( see the first paragraph, Introduction, Section 2.5, 3.4,

and Table 2). Since the pinewood of Brelid is made by a process substantially identical with the process of the claim, it's reasonably expected that the esterified pinewood of Brelid would also have less than about 1% of combined acetic anhydride and by-product acetic acid. If there is any difference, the difference must be minor and obvious.

On the other hand, Brelid discloses that the total residue chemicals that include acetic anhydride, by-product acetic acid and other solvents used in the process are about 1.6 %. It is reasonable to expect that the combined acetic anhydride and acetic acid in the final esterified wood is less than 1% as being claimed. If it's not, it would be very close to the claimed range and it would have been obvious to one having ordinary skill in the art to modify the esterified pinewood of Brelid by further removing the residual chemicals to a level where the combined acetic anhydride and acetic acid being less than 1% in order to improve the structure of the final wood product.

***Claim Rejections - 35 USC § 103***

3. Claims 19 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Brelid et al. in view of USP No 4804384.

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As in the above rejection, Brelid teaches a process for esterifying pinewood substantially comprising every limitation of the instant claimed process. However, Brelid does not disclose the impregnating time of 15 to 30 min. The US'384 teaches impregnating time between 1-15 min

(col. 4, lines 1-62). It is well within the skill of an average artisan to increase the impregnation time for wood pieces having bigger dimensions to allow the acetic anhydride to penetrate into the wood fibers. It would have been obvious to one having ordinary skill in the art to increase time of impregnation as taught by US'384 since such would allow sufficient time for the acetic anhydride to penetrate into the wood structure.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brelid in view of USP'431.

As discussed above, Brelid teaches a process for esterifying pinewood substantially as claimed. Brelid does not teach removing moisture from the starting wood with solvent. The US'432 teaches the use of solvent, see Fig 1, and claim 1. It would have been obvious to one having ordinary skill in the art to modify process of Brelid by using a high temperature solvent to remove water as taught by USP'431 prior to impregnating the wood in order to enhance the impregnation of acetic anhydride into the cellulose fibers.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to leszek b kiliman whose telephone number is 571-272-1509. The examiner can normally be reached on M-T, 6.30-5.00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lk

LESEK KILIMAN, PhD  
PATENT EXAMINER  
*Leszek Kiliman*